

## REMARKS

In complete response to the outstanding Official Action of July 23, 2003, on the above-identified application, reconsideration is respectfully requested. Claims 1-20 are pending in the application. Claims 1-5, 12-14, and 18-20 are rejected. Claims 6-11 and 15-17 are objected to. New Claims 21-26 are being added pursuant to the Examiner's comments.

### Claim Rejections Under 35 U.S.C. § 102

Claims 19 and 20 are rejected under 35 U.S.C. § 102 (e) as being anticipated by Boroson et al. (US Patent 6,226,890).

Applicants respectfully contend that the present invention is not anticipated by Boroson et al. (US Patent 6,226,890).

The Examiner cites:

Boroson et al. (US Patent 6,226,890) discloses an apparatus for measuring and predicting moisture absorption rate in materials, the apparatus comprising: a substantially air-tight container adapted for placing a test specimen therein (abstract); means for establishing controlled atmospheric conditions in said container; and means for monitoring said atmospheric conditions within said container (Col. 3-4, lines 49-34); The apparatus further including: means for circulating said atmosphere within said container (Col. 3-4, lines 49-34).

Applicants acknowledge that Boroson et al. (US Patent 6,226,890) discloses a **method of desiccating an environment** surrounding a moisture-sensitive electronic device sealed within an enclosure to **prevent premature failure or degradation** of performance of such **device**. The desiccant selected comprises of solid particles having a particle size range 0.1 to 200 micrometers. A **liquid binder** may be blended with dessicant particles to **maintain and/or to enhance its moisture absorption rate**.

In contrast, the present invention relates to an **apparatus and a method for measuring and predicting moisture absorption** by specific hygroscopic materials. This invention enables the rapid development of complete "families" of absorption isotherms from a minimal amount of "real" experimental data.

The claimed apparatus is used for measuring the moisture absorption rate comprises a substantially air-tight container provided with the necessary means for **establishing and monitoring a controlled atmosphere** (with a known relative humidity and temperature in an inert gaseous atmosphere) and if necessary, with the means for circulating said atmosphere.

The claimed method is used for predicting the moisture absorption rate of a material comprises the steps of drying and weighing the material, placing the material in the apparatus, exposing the material to the controlled atmosphere, and measuring moisture absorption (content) over time. Moisture content is curve-fitted against time to yield the following relationship:

$$Y = aX^b$$

wherein Y is moisture content, gm of H<sub>2</sub>O/100gm of material,

wherein X is humidification time, hour,

wherein a is a constant relative to the humidity and temperature and is in the range of 0.001 to 1.0, and

wherein b is a constant relative to the type of material and is in the range of 0.01 to 10.0.

Additionally, this predictive technique will aid in selecting the appropriate:

- 1) controlled moisture environment that minimizes water absorption of the stored hygroscopic materials that are sensitive to moisture absorption and/or
- 2) moisture sensitivity level (MSL) rating that is best suited for the prevailing or created moisture environment.

In short, Boroson et al. (US Patent 6,226,890) teaches a method to react to existing humidity, whereas the present invention is directed to a method for predicting humidity absorption.

Hence, the present invention as defined by Claims 19 and 20 is not anticipated by Boroson et al. (US Patent 6,226,890) as each and every limitation of the claims is not taught by this reference.

### **Claim Rejection Under 35 U.S.C. § 103**

Claims 1, 2-5, 12-14 and 18 are rejected under 35 U.S.C. § 103 (a) as being unpatentable over Boroson et al. (US Patent 6,226,890) in view of Shigeta et al. (US Patent 5,078,909).

Applicants respectfully contend that the present invention is patentable over Boroson et al. (US Patent 6,226,890) in view of Shigeta et al. (US Patent 5,078,909).

#### **The Examiner notes:**

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Boroson to have a constant  $a$  is a variable that is directly proportional to the relative humidity in an inert gaseous atmosphere; and modifying the variable  $a$  and holding the variable  $b$  constant to generate an expected moisture absorption mass gain versus time curve for a different specific relative humidity value, collecting data of moisture absorption over time and using a curve fitting technique to fit the data to a curve using the equation  $Y = AX^b$  taught by Shigeta in order to have the moisture calculation absorbent material to protect precision instrument and parts (Col. 12, lines 6-11).

Shigeta (US Patent 5,078,909) discloses a **moisture-absorbent composition**, which contains a thermoplastic resin, a **moisture-absorbent**

**substance** and when necessary a **moisture sensitive color-varying substance** that can be easily molded into desired shapes and forms for **protecting materials** from moisture. It further discloses an **indicator function** feature characterized by showing colors changing in accordance with the rate of moisture absorption by the addition of anhydrous cobalt chloride. Therefore, it would not be obvious to one skilled in the art to apply Shigeta et al. (US Patent 5,078,909) to the present invention.

The present invention relates to **hygroscopic materials** that are sensitive to moisture absorption. The primary hygroscopic materials are plastic encapsulated microchips (PEM) packages including multiple ball grid array (BAG), plastic leaded chip carrier (PLCC), and plastic metric quad flatpack packages (P-MQFP).

In sum, Shigeta (US Patent 5,078,909) protects materials from moisture absorption by a resin, whereas the present invention claims an apparatus and a method for measuring and predicting moisture absorption by specific hygroscopic materials.

Hence, one of ordinary skill in the art would not find that Boroson et al. (US Patent 6,226,890) in view of Shigeta et al. (US Patent 5,078,909) either teaches or suggests the present invention of Claims 1, 2-5, 12-14 and 18.

### **Claim Objections**

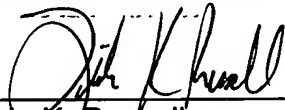
Claims 6-11 and 15-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all the limitations of the basis claim and intervening claims. Accordingly, new Claims 21-26 are being added which incorporate the necessary limitations.

Application No. 10/017,403  
Amendment dated December 23, 2003  
Reply to Office Action of July 23, 2003

## CONCLUSION

Accordingly, it is believed that the present application now stands in condition for allowance. Early notice to this effect is earnestly solicited. Should the examiner believe a telephone call would expedite the prosecution of the application, he is invited to call the undersigned attorney at the number listed below.

Respectfully submitted,



---

Linda K. Russell  
Registration No. 34,918

Date: December 23, 2003  
Air Liquide  
2700 Post Oak Blvd., Suite 1800  
Houston, Texas 77056  
(713) 624-8956 Phone  
(713) 624-8950 Fax

Application No. 10/017,403  
Amendment dated December 23, 2003  
Reply to Office Action of July 23, 2003

**CERTIFICATE OF MAILING UNDER 37 CFR 1.8(a)**

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 23rd day of December, 2003.



---

Stacy Forte